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PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT  
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference RS/hr-16149		<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/CH 03/00231	International filing date (day/month/year) 09.04.2003	Priority date (day/month/year) 01.10.2002	
International Patent Classification (IPC) or both national classification and IPC H01F27/28			
Applicant DELTA ENERGY SYSTEMS (SWITZERLAND) AG et al.			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 5 sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the opinion</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input checked="" type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>			
Date of submission of the demand  30.04.2004		Date of completion of this report  17.01.2005	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized Officer  Gols, J  Telephone No. +49 89 2399-2616 	

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. **PCT/CH 03/00231**

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, Pages**

1-20 as originally filed

**Claims, Numbers**

1-20 received on 31.12.2004 with letter of 22.12.2004

**Drawings, Sheets**

1/4-4/4 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**IV. Lack of unity of invention**

1. In response to the invitation to restrict or pay additional fees, the applicant has:

- ☒ restricted the claims.  
☐ paid additional fees.  
☐ paid additional fees under protest.  
☐ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

- ☒ complied with.  
☐ not complied with for the following reasons:

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☒ all parts.  
☐ the parts relating to claims Nos. .

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes: Claims	1-20
	No: Claims	

Inventive step (IS)	Yes: Claims	1-20
	No: Claims	

Industrial applicability (IA)	Yes: Claims	1-20
	No: Claims	

**2. Citations and explanations**

**see separate sheet**

**V**

1. Claim 1:

**Technical field:** A coil form for forming an inductive element with a core

**Prior art:** X-documents DE-A-19 505 463 and EP-A-0 293 617 disclose a coil form according to the preamble of claim 1.

**Problem:** To provide a coil form allowing improved heat dissipation.

**Solution:** The coil form according to claim 1 is characterised in that separating plates are spaced at a specific plate-distance, where a ratio of the plate-distance to a diameter of the wire is between 1 and 2.

**Inventive step:** in the X-documents additional to the use of separating plates, insulating platers are added between the coils and separating plates. These insulating plates decrease the heat dissipation of the coils. The defined ratio for the plate-distance ensures that the wire winding wound in the coils area is in close contact with the separating plate made of metal, whereby the heat dissipation through the separating plate is improved. None of the available prior art suggests the above-mentioned ratio for the plate-distance. Consequently claim 1 meets the requirements of Articles 33(2) - (4) EPC.

2. Claim 18:

The claim relates to a method for forming an inductive element by positioning separating plates at a specific plate-distance by winding a wire in the coil area thereby pressing the separating plates against a side support. The pressing of the separating plates against the side support, causes the wound wire to be pressed against the separating plates. It is concluded that claim 18 meets the requirements of Articles 33(2) - (4) EPC for the reason as given above.

3. Claims 2 - 17 and 19 - 20:

The subject-matter of these claims relates to embodiments of the invention as set out in the independent claims and as such meet the requirements of Article 33(2) - (4) PCT.

**VII**

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/CH 03/00231

1. To meet the requirements of Rule 5.1(a)(ii) PCT, one of the documents DE-A-19 505 463 and EP-A-0 293 617 should have been identified in the description and the relevant background art disclosed therein should have been briefly discussed.
2. The description is not in conformity with the claims as required by Rule 5.1(a)(iii) PCT. Especially the embodiments relating to the deleted originally filed claims should have been removed from the application documents.

**VII, VIII**

1. In claim 18 it should have been made clear that "a separating plate (3)" relates to the "separating plates (103)" (Article 6 PCT).

**Claims**

1. A coil form (1, 1.1) for forming an inductive element with a core (11.1, 11.2), including
  - a) a first coil and a second coil,
  - b) a hollow coil body (2) for insertion of the core, the coil body (2) being made of an electrically insulating material and having a coil area on its outer surface for holding a wire (16) that forms a part of the first coil and
  - c) a separating plate (3, 3.1) which surrounds the outer surface of the coil body thereby providing said coil area (15, 15.1),characterised in that
- the separating plate is made of metal, includes an opening (4) for pushing the separating plate over the coil body and a slit (5) for prohibiting short circuits and leakage currents within the separating plate, and in that the separating plate forms a winding of the second coil (16).
2. A coil form according to claim 1, characterised in that the coil body (2) includes a coil portion (6) of a kind of a hollow cylinder for slipping over the separating plate (3) and a flange portion (7) on an end region of the coil portion.
3. A coil form according to claim 2, characterised in that it includes two separating plates and in that the coil portion includes a second flange portion on a second end region of the coil portion, the flange portions forming a side support for the separating plates.
4. A coil form according to claim 3, characterised in that it includes four separating plates and a projection (123) that surrounds the outer surface of the coil body (102), the projection forming a side support for two separating plates and the separating plates being equally spaced at a specific plate-distance.

5. A coil form according to claim 4, characterised in that a ratio of the plate-distance to a diameter of the wire is between 1 and 2, preferably between 1.1 and 1.4.
6. A coil form according to any of claims 1 to 5, characterised in that the coil portion (106) includes a recess (127) on an inner surface and an opening (126) in its outer surface in a region of said recess, where said wire (128) is fed from an outside of the coil portion to an inside of the coil portion through said recess and from the inside of the coil portion to the outer surface of the coil portion through said opening.
7. A coil form according to any of claims 1 to 6, characterised in that said flange portion includes a plurality of holes, where a pin (125) is inserted into at least one hole, said pin being electrically conductively connectable to an end of one of the coils.
8. A coil form according to any of claims 1 to 7, characterised in that two or more separating plates are electrically conductively connected to form a plurality of windings of the second coil.
9. A coil form according to any of claims 1 to 8, characterised in that a shape of the opening (4) of the separating plate substantially corresponds to a shape of the outer surface of the coil body and in that an internal diameter of the separating plate is smaller than an outer diameter of the coil body.
10. A coil form according to any of claims 1 to 9, characterised in that the coil body comprises at least two elements (20.1, 20.2) with means (21, 22) to fit the elements together to form the coil body.
11. A coil form according to claim 10, characterised in that the coil body comprises a first and a second element (20.1, 20.2) and in that the means to fit the elements together include a recess (21) on the first element and a corresponding projection (22) on the second element.

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12. A coil form according to any of claims 10 to 11, characterised in that the coil portion is of a kind of a right cylinder, where the coil body is separated into two elements by a plane being perpendicular to a base plane of the right cylindrical coil portion.
- 5 13. A coil form according to claim 2, characterised in that the coil portion includes a recess (8) for positioning of the separating plate and in that the flange portion includes a plurality of terminals (9) where at least one terminal is electrically conductively connectable to an end of one of the at least two coils.
- 10 14. An inductive element with a coil form according to any of claims 1 to 13, including a core (11.1, 11.2) inserted into the hollow coil body, a wire provided on the outer surface of the coil body forming a part of a first coil of the inductive element and a metallic separating plate that surrounds the outer surface of the coil body and forms a part of a second coil of the inductive element.
- 15 15. An inductive element according to claim 14, characterised in that it includes a plurality of separating plates (3, 3.1), where an isolation plate (19) is provided between two adjacent separating plates.
- 16 16. An inductive element according to any of claims 14 to 15, characterised in that the core (11.1, 11.2) of the inductive element has a shape of two rectangular portions with a common edge (13), where the common edge is inserted into the hollow coil body and whereby the core preferably includes two E-shaped parts (11.1, 11.2).
- 20 17. An inductive element according to any of claims 14 to 16, characterised in that it includes at least two coil forms according to any of claims 1 to 13, where the core (11.1, 11.2) is inserted into the hollow coil body of each coil form.
18. A coil form having a hollow coil body for insertion of a core of an inductive element and having an outer surface for holding a coil of the inductive element, characterised



in that the coil body includes at least two elements (20.1, 20.2) with means (21, 22) to fit the elements together to form the coil body.

- 5 19. A coil form according to claim 18, characterised in that the coil body includes a first and a second element (20.1, 20.2) and in that the means to fit the elements together include a recess (21) on the first element and a corresponding projection (22) on the second element.
- 10 20. A coil form according to any of claims 18 to 19, characterised in that the coil body includes a flange portion (7) and a coil portion (6) which is of a kind of a right cylinder, where the coil body (2) is separated into two elements (20.1, 20.2) by a plane being perpendicular to a base plane of the right cylindrical coil portion.
21. A coil form according to any of claims 18 to 20, characterised in that it includes an additional hollow outer coil body for insertion of the coil body and for pushing over the separating plate.
- 15 22. Method for forming an inductive element with a hollow coil body (2), a core (11.1, 11.2), a first coil and a second coil, where a part of the first coil (16) is provided by winding a wire in a coil area around an outer surface of the coil body, characterised in that a winding of the second coil is provided by pushing a metallic separating plate (3) with an opening over the coil body.
- 20 23. Method according to claim 22, characterised in that said wire is fed from an outside of the coil body (102) to an inside of the coil body through a recess (127) on an inner surface of the coil body and from said recess to the outer surface of the coil body through an opening (126) in the coil body in a region of said recess.

24. Method according to claim 22 or 23, characterised in that said winding area is provided by pushing two metallic separating plates (103) over the coil body and positioning the separating plates at a specific plate-distance.
- 5 25. Method according to any of claims 22 to 24, characterised in that a plurality of winding areas (124) is provided by pushing a plurality of metallic separating plates over the coil body and spacing them equally at a specific plate-distance and in that a wire (128) is wound around the outer surface of the coil body in each winding area simultaneously.

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